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Catalogue, several groups of nebulae have been discovered, in some of which nebulous connexion has been detected between individuals of the group, in others not. Sketches of some have been made and measures taken; but although the subject of grouped or knotted nebulae is considered one of deep interest, it has not yet been proceeded with far enough to warrant entering upon it in the present paper.

The conclusion of the paper is occupied with remarks relating to each figure, in order to render the information conveyed by it more complete, and these are stated to be for the most part extracts selected from the Journal of Observations.

2. "Electro-Physiological Researches.—Ninth Series." By Signor Carlo Matteucci. Communicated by W. R. Grove, Esq., F.R.S.

In the first portion of this paper the author refers to a work recently published by M. Du Bois Raymond "On the law of Muscular Current, and on the modification which that law undergoes by the effect of Contraction;" which work M. Matteucci states obliges him to transmit to the Royal Society certain researches the publication of which he would otherwise have wished to delay. He then refers to his previous researches published in the Philosophical Transactions for the years 1845 and 1847, and in the Annales de Chimie for October 1847. From the experiments detailed in those papers, and from certain points of doubt which he indicates, he considers himself authorized in concluding that the development of electricity by muscular contraction still remains to be demonstrated by experiment, and that the phenomenon of induced contraction is still that which leads most directly to this result.

He then gives a series of experiments illustrated by figures, and from them deduces the following conclusions:—

1st. The cause of induced contraction, according to all analogies, is the same as that which produces contraction of the galvanoscopic frog in several of the experiments given.

2ndly. The cause of these contractions is evidently an electrical phenomenon developed in the act of contraction, and which consists in a different state of electricity in the different points of the contracted limb.

3rdly. This electrical phenomenon, like the contraction which produces it, lasts only for an instant.

4thly. These electric states, developed by contraction, tend to produce electrical currents which circulate in opposite directions across a conducting arch interposed between the two limbs, which contract at the same time.

The author further states, that, whatever the theory of these phenomena may be, it is certain that they demonstrate the production of an electrical *disequilibrium* in the act of muscular contraction. Upon the question whether the cause of the species of discharge described is a phenomenon analogous to that of electrical fish, or a change in the natural conditions of the muscular current, the author, though leaning to the former alternative, forbears to express a posi-

tive opinion, as further experiments are wanting to furnish sufficient grounds for a decision.

3. "On the Condition of certain Elements at the moment of Chemical Change." By B. C. Brodie, Esq., F.R.S.

This paper contains an experimental inquiry, founded upon certain theoretical considerations as to the condition of bodies at the moment of chemical change, with the discussion of which the introduction is occupied.

The author considers that the peculiar combining properties of the elemental particles of which chemical substances are composed, are due to a chemical polarity of the acting masses, which takes place at the contact of the bodies, and have only a remote relation to the electro-chemical nature of the isolated element. In support of this view are cited the phænomena of double decomposition, and the properties of the so-called "nascent" elements, which could never be inferred from the nature of the element when once isolated and formed. Double decomposition the author considers to be the true type of all chemical action. In the case of the bodies called compound, this polarity is manifested by the division of the substance into two parts, which are universally considered to stand to one another in a certain positive and negative relation; and also by the synthesis, which corresponds to this division.

The object of the paper is to point out that an analogous polar relation exists, at the moment of chemical change, between the particles of which the elemental bodies themselves are composed, of which condition we have evidence both when the isolated element is chemically acted on by other bodies, and also in certain cases of the formation of the element from its compounds, in which we have a division and synthesis of the element corresponding (so far as this polar relation is considered) to the division and synthesis of a compound body. The evidence of these statements is, that when the isolated element is chemically acted upon, we may observe in it (as manifested by its combining properties) the same polar or nascent state as is developed in compound bodies; and also that we have certain remarkable cases of the synthesis of the element, to account for which we must assume the same combining relation between its particles as between the particles of which a compound substance is formed. These statements are supported by numerous instances.

The experimental inquiry relates to a remarkable case of the formation of oxygen, in which the author considers that the mutual attraction of the particles of that element determines the decomposition of the substances from which it is evolved. The experiment in question is the mutual decomposition which the peroxide of hydrogen and certain metallic oxides, first discovered by Thénard, undergo when in contact. Thus the author regards, in this case, the decomposition of the metallic oxide as a phænomenon which may be represented thus:—

